

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A mobile data communication system for a wireless data communication, comprising:

a plurality of mobile stations;

a plurality of base stations and base station controllers for transferring a signal transmitted from said mobile stations and a signal transmitted to said mobile stations in a predetermined service area;

a mobile switching center for detecting a service option included in the signal transmitted from the base stations and base station controllers and for ~~executing~~ switching between a circuit data service ~~[[or]]~~ and a packet data service ~~according to~~ based on the detected service option; and

at least one mobile data network interworking unit for establishing a traffic channel of a mobile data path and a call between a calling party mobile station and a called party mobile station when said mobile switching center performs the circuit data service, wherein first and second data paths are established between the mobile switching center and the least one mobile data network interworking unit.

2. (Previously Presented) The mobile data communication system claimed in claim 1, wherein said mobile switching center comprises:

a mobile connection control module for detecting the service option included in the signal transmitted from said base station and base station controllers and for generating a switching signal controlling an interface connection;

a mobile data path connection control module for controlling the connection to a mobile network data path according to the switching signal of said mobile connection control module;

a public network data path connection control module for controlling the connection to a public network data path according to the output signal of said mobile data network interworking unit; and

a trunk connection control module for transmitting an output signal of said public network data path connection control module or said mobile network data path connection control module to a public switched telephone network or to a second mobile switching center according to the switching signal of said mobile data path control module or said public network data path connection control module.

3. (Previously Presented) The mobile data communication system claimed in claim 1, wherein said mobile station comprises a data terminal coupled to a mobile terminal.

4. (Previously Presented) The mobile data communication system claimed in claim 3, wherein said data terminal comprises one of notebook computer, personal digital assistant, laptop computer, palmtop computer, portable and small computer.

5. (Previously Presented) The mobile data communication system claimed in claim 1, wherein each of said mobile stations comprises a protocol stack for circuit data and a call processing module for processing packet data.

6. (Currently Amended) The mobile data communication system claimed in claim 1, wherein said mobile data network interworking unit comprises:

a data path connection section for forming a path connection between said mobile switching center and mobile data network interworking unit;

a main processing section forming a traffic channel of a mobile data path between the calling party mobile station and the called party mobile station to execute a circuit data communication or a packet data communication according to a received signal from said data path connection section;

a circuit data processing section analyzing the signal transmitted from said calling party mobile station if the protocol between the calling party mobile station and the called party mobile station is normally executed when said main processing section performs the circuit data

service and then transmitting a called party identification number to said main processing section; and

a switching section selectively switching the connection between said circuit data processing section and said data path connection section according to the control signal of said main processing section.

7. (Previously Presented) The mobile data communication system claimed in claim 6, wherein said main processing section comprises:

a mobile data path control module for establishing a link with said mobile switching center;

a circuit data control module controlling the exchange of traffic data information between said mobile station and circuit data processing section;

a modem control module controlling a modem equipped in said circuit data processing section; and

a public network data path control module for establishing the link with said mobile switching center.

8. (Previously Presented) The mobile data communication system claimed in claim 6, wherein said circuit data processing section comprises:

an interface control section performing an interface between said main processing section and said circuit data processing section;

at least one modem; and

a modem controller controlling an operation of the at least one modem according to a modem control signal of said interface control section.

9. (Previously Presented) The mobile data communication system claimed in claim 1, wherein said mobile data communication system comprises a CDMA mobile data communication system.

10. (Previously Presented) A wireless data communication method in which at least one mobile switching center including a mobile connection control module, a mobile data path connection control module, a public network data path connection control module and a trunk connection control module are connected with at least one data network interworking unit by a first data path and a second data path, comprising:

inputting an identification number of a called party mobile station;

establishing a first call from a calling party mobile station to a mobile data network interworking unit and then establishing a first traffic channel;

calling the called party mobile station at the mobile data network interworking unit;

establishing a second call from said called party mobile station to the mobile data network interworking unit when a data response comes from said called party mobile station and then establishing a second traffic channel after the mobile data path connection module informs the public network data path connection control module of a normal state of a first data path between a mobile switching center and the mobile data network interworking unit;

establishing a call between the mobile switching center and the mobile data network interworking unit through a second data path; and

connecting said first and second traffic channels through at least one modem of the interworking unit to perform circuit data service.

11. (Previously Presented) The wireless data communication method claimed in claim 10, wherein said first data path is a mobile data path and said second data path is a public network data path.

12. (Previously Presented) The wireless data communication method claimed in claim 10, wherein the identification number of said called party mobile station is inputted by an ATD command and the data response is automatically generated by a present automatic response or ATA command.

13. (Currently Amended) The wireless data communication method claimed in claim 10, wherein ~~said steps for~~ establishing the first call comprises:

deciding a service option included in the signal transmitted from said calling party mobile station; and

requesting said data network interworking unit to establish a call when said service option is to request a circuit data communication service.

14. (Currently Amended) The wireless data communication method claimed in claim 10, wherein ~~said step of~~ establishing the first traffic channel comprises:

initializing a first modem equipped in the data network interworking unit;

connecting a path between said calling party mobile station and the data network interworking unit to modem;

establishing a communication protocol between said calling party mobile station and the data networking unit;

transmitting the identification number of said calling party mobile station and said modem initialization specification from said calling party mobile station to the first modem; and

reestablishing with a modem initialization specification required by said calling party mobile station.

15. (Currently Amended) The wireless data communication method claimed in claim 14, wherein ~~said step of~~ initializing the first modem comprises:

deciding whether or not there is an idle resource in the first modem; and

establishing a basic configuration value when there is an idle resource in the first modem.

16. (Currently Amended) The wireless data communication method claimed in claim 10, wherein ~~said step of~~ calling the called party mobile station comprises:

transmitting a connection request message from the mobile data network interworking unit to said mobile switching center;

requesting an incoming connection from said mobile station to said called party mobile station; and

calling a mobile terminal of said called party mobile station.

17. (Currently Amended) The wireless data communication method claimed in claim 10, wherein ~~the step of~~ establishing said second call comprises:

detecting a service option included in the signal transmitted from said called party mobile station; and

requesting the data network interworking unit to establish a call when said detected service option is for a circuit data communication service.

18. (Currently Amended) The wireless data communication method claimed in claim 10, wherein ~~the step of~~ establishing said second traffic channel comprises:

initializing a second modem equipped in the data network interworking unit;
connecting a path between said called party mobile station and the data network interworking unit to modem;
establishing a communication protocol between said called party mobile station and the data network interworking unit;
transmitting said incoming response receive message and said modem initialization specification from said called party mobile station to the second modem; and
reestablishing a modem initialization specification required by said calling party mobile station.

19. (Currently Amended) The wireless data communication method claimed in claim 18, wherein ~~the step of~~ initializing the modem comprises:

deciding whether or not there is an idle resource in the second modem; and
establishing a basic configuration value when there is an idle resource in the second modem.

20. (Currently Amended) The wireless data communication method claimed in claim 10, wherein ~~the steps of~~ establishing said first and second calls and connecting the traffic channel comprises:

informing the public network data path connection control module by the mobile data path connection control module that said first data path is normally established;

establishing a call between the public network data path connection control module and the data network interworking unit through said second data path;

connecting a path of the first call with a path of the second call in the public network data path connection control module;

making the traffic channel between the mobile connection control module and the public network data path connection control module inactive;

receiving both a connection request message transmitted from said calling party mobile station through the mobile switching center and an incoming response message transmitted from said called party mobile station into the data network interworking unit;

connecting at least one modem equipped in the data network interworking unit which is assigned to link said connection request message and said incoming response message to each other; and

confirming the connection of the at least one modem.

21. (Previously Presented) A wireless data communication method in which at least one mobile switching center having a mobile connection control module, a mobile data path connection control module, a public network data path connection control module and a trunk connection control module is connected with at least one data network interworking unit through a first data path and a second data path to perform circuit data service, comprising:

- a) inputting an identification number of a called party mobile station;
- b) establishing a first traffic channel after establishing a first call from a calling party mobile station to a first mobile data network interworking unit having at least one modem through a first mobile switching center;
- c) calling a called party mobile station controlled by a second mobile switching center from said first mobile data network interworking unit through said public network data path connection control module and said trunk connection control module;
- d) establishing a second traffic channel after a second call from said called party mobile station to a second mobile data network interworking unit having at least one modem is established when said called party mobile station responds and said mobile data path connection module informs said public network data path connection control module of a normal state of a first data path;
- e) establishing a call between said public network data path connection control module and said second mobile data network interworking unit after said mobile data path connection control module informs said public network data path connection control module of

the completion of channel establishment when said second traffic channel is completely established;

f) releasing the traffic channel between said mobile connection control module and said public network data path connection control module when the call establishment between the public network data path connection control module and said second mobile data network interworking unit is completed; and

g) connecting said public network data path connection control module with the trunk connection control module.

22. (Previously Presented) The method of claim 21, wherein establishing the first traffic channel comprises:

initializing a first modem equipped in the data network interworking unit;

connecting a path between said calling party mobile station and the data network interworking unit to modem;

establishing a communication protocol between said calling party mobile station and the data networking unit;

transmitting the identification number of said calling party mobile station and said modem initialization specification from said calling party mobile station to the first modem; and

reestablishing with a modem initialization specification required by said calling party mobile station.

23. (Currently Amended) The wireless data communication method claimed in claim 22, wherein ~~the step of~~ initializing the first modem comprises:

deciding whether or not there is an idle resource in the first modem; and
establishing a basic configuration value when there is an idle resource in the first modem.

24. (Currently Amended) The wireless data communication method claimed in claim 21, wherein ~~the step of~~ establishing said second traffic channel comprises:

initializing a second modem equipped in the data network interworking unit;
connecting a path between said called party mobile station and the data network
inter-working unit to modem;

establishing a communication protocol between said called party mobile station
and the data network inter-working unit;

transmitting said incoming response receive message and said modem initialization
specification from said called party mobile station to the second modem; and

reestablishing a modem initialization specification required by said calling party
mobile station.

25. (Currently Amended) The method of claim 24, wherein ~~the step of~~ initializing the modem comprises:

deciding whether or not there is an idle resource in the second modem; and
establishing a basic configuration value when there is an idle resource in the second modem.

26. (Previously Presented) The method of claim 21, wherein the identification number of said called party mobile station is inputted by an ATD command and the data response is automatically generated by a preset automatic response mode or an ATA command.

27. (Currently Amended) A mobile data communication system, comprising:
at least one base station and base station controller, configured to receive and transfer a signal from at least one mobile station and a signal transmitted to the at least one mobile station in a prescribed service area;

a mobile switching center (MSC) configured to detect a service option included in the signal transmitted from the at least one base station and base station controller and to ~~execute~~ switch between a circuit data service ~~[[or]]~~ and a packet data service ~~according to~~ based on the detected service option; and

at least one mobile data network interworking unit coupled to the MSC to establish a traffic channel of a mobile data path and a call between a calling party mobile station

and a called party mobile station when said mobile switching center performs the circuit data service, wherein first and second data paths are established between the MSC and the least one mobile data network interworking unit.

28. (Previously Presented) The system of claim 27, wherein the at least one mobile data network interworking unit comprises:

- a main processing circuit configured to form the traffic channel of the mobile data path and the call between the calling party mobile station and the called party mobile station;

- a circuit data processing circuit configured to transmit the called party identification number to the main processing circuit if the main processing circuit is performing a circuit data service;

- a packet data processing circuit configured to transmit the called party identification number to the main processing circuit if the main processing circuit is performing a packet data service;

- an interface control section, configured to provide an interface between the main processing circuit and the circuit data processing circuit;

- at least one modem; and

- a modem controller configured to control an operation of the at least one modem according to a modem control signal of the interface control section.

29. (Previously Presented) The system of claim 27, wherein the at least one mobile data network interworking unit, comprises:

at least one processor;

at least one modem; and

a modem controller, configured to receive a modem control signal from the at least one processor and control the modem in accordance with the modem control signal.

30. (Previously Presented) The system of claim 29, wherein the communication system comprises a CDMA communication system.

31. (Previously Presented) The system of claim 27, wherein the mobile switching center comprises:

a mobile connection control module to detect a service option included in the signal transmitted from the at least one base station and base station controller, and to generate a switching signal to control an interface connection;

a mobile data path connection control module, configured to control a connection to a mobile network data path according to the switching signal of the mobile connection control module;

a public network data path connection control module, configured to control a connection to a public network data path according to an output signal of the mobile data network interworking unit; and

a trunk connection control module, configured to transmit an output signal of one of the public network data path connection control module and the mobile data path connection control module to one of a public switched telephone network and a second mobile switching center according to the output signal of the mobile data path control module or the public network data path connection control module.

32. (Previously Presented) An interworking unit for a wireless communication system, comprising:

a data path connector to couple over at least first and second data paths to a mobile switching center;

a main processor to form a traffic channel of a mobile data path between a first mobile terminal and a second mobile terminal when a circuit data service option is detected by the mobile switching center from a base station;

a circuit data processor, coupled to the main processor and configured to analyze a signal transmitted from the first mobile terminal if a protocol between the first mobile terminal and the second mobile terminal is normally executed, and to transmit an identification number from the second terminal to the main processor; and

a switching circuit, configured to selectively switch a connection between the circuit data processor and the data path connector in accordance with a control signal from the main processor to perform circuit data service, wherein the circuit data processor comprises at least one modem.

33. (Previously Presented) The mobile data communication system claimed in claim 32, wherein the main processor comprises:

a mobile data path control module coupled to establish a link with the mobile switching center;

a circuit data control module configured to control the exchange of traffic data information between the first mobile terminal and a circuit data processor;

a modem control module configured to control the at least one modem; and

a public network data path control module coupled to establish the link with the mobile switching center.

34. (Previously Presented) The mobile data communication system claimed in claim 32, wherein the circuit data processor comprises:

an interface controller to provide an interface between the main processor and the circuit data processor; and

a modem controller coupled to control an operation of the at least one modem according to a modem control signal provided by the interface controller.

35. (Currently Amended) A method of performing wireless data communications, comprising:

inputting an identification number of a first mobile station;

establishing a first call from a second mobile station to a ~~said~~ mobile data network interworking unit and then establishing a first traffic channel;

calling the first mobile station at the mobile data network interworking unit;

establishing a second call from the first mobile station to the mobile data network interworking unit when a data response comes from the first mobile station and then establishing a second traffic channel after a mobile data path connection module informs a public network data path connection control module of a normal state of the first data path;

establishing a call between a mobile switching center and the mobile data network interworking unit through the second data path; and

connecting the first and second traffic channels through at least one modem of the mobile data network interworking unit to perform circuit data service.

36. (Previously Presented) The method of claim 35, wherein the first data path is a mobile data path and the second data path is a public network data path.

37. (Previously Presented) The method of claim 35, wherein the identification number of the first mobile station is inputted by an ATD command and the data response is automatically generated by a preset automatic response mode or an ATA command.

38. (Previously Presented) The system of claim 1, wherein the at least one mobile data network interworking unit comprises a module for providing circuit service and a module for providing packet based service, and wherein different protocol stacks are used for packet service and circuit service.

39. (Previously Presented) The system of claim 38, wherein the at least one mobile data network interworking unit comprises at least one module for connecting a first protocol to a second protocol for interface with the interworking function.

40. (Previously Presented) The method of claim 1, wherein the first data path is a mobile data path and the second data path is a public network data path.

41. (Previously Presented) The mobile data communication system claimed in claim 6, wherein the data terminal and the mobile terminal are integrated to form a single device.

42. (Previously Presented) The system of claim 27, wherein the at least one mobile data network interworking unit comprises:

a data path connector to couple to a mobile switching center;

a main processor to form a traffic channel of a mobile data path between a first mobile terminal and a second mobile terminal when a circuit data service option is detected by the mobile switching center from a base station;

a circuit data processor, coupled to the main processor and configured to analyze a signal transmitted from the first mobile terminal if a protocol between the first mobile terminal and the second mobile terminal is normally executed, and to transmit an identification number from the second terminal to the main processor; and

a switching circuit, configured to selectively switch a connection between the circuit data processor and the data path connector in accordance with a control signal from the main processor, wherein the circuit data processor comprises at least one modem, and wherein the main processor comprises:

a mobile data path control module coupled to establish a link with the mobile switching center;

a circuit data control module configured to control the exchange of traffic data information between the first mobile terminal and a circuit data processor;

a modem control module configured to control the at least one modem;

and

a public network data path control module coupled to establish the link with the mobile switching center.

43. (Previously Presented) The system of claim 27, wherein the at least one mobile data network interworking unit comprises:

a data path connector to couple to a mobile switching center;

a main processor to form a traffic channel of a mobile data path between a first mobile terminal and a second mobile terminal when a circuit data service option is detected by the mobile switching center from a base station;

a circuit data processor, coupled to the main processor and configured to analyze a signal transmitted from the first mobile terminal if a protocol between the first mobile terminal and the second mobile terminal is normally executed, and to transmit an identification number from the second terminal to the main processor; and

a switching circuit, configured to selectively switch a connection between the circuit data processor and the data path connector in accordance with a control signal from the main processor, wherein the circuit data processor comprises at least one modem, and wherein the circuit data processor comprises:

an interface controller to provide an interface between the main processor and the circuit data processor; and

a modem controller coupled to control an operation of the at least one modem according to a modem control signal provided by the interface controller.

44. (Previously Presented) The system of claim 27, wherein the at least one mobile data network interworking unit comprises a module for providing circuit service and a module for providing packet based service, and wherein different protocol stacks are used for packet service and circuit service.

45. (Previously Presented) The system of claim 44, wherein the at least one mobile data network interworking unit comprises at least one module for connecting a first protocol to a second protocol for interface with the interworking function.

46. (Previously Presented) The method of claim 27, wherein the first data path is a mobile data path and the second data path is a public network data path.

47. (Previously Presented) The system of claim 32, wherein the interworking unit further comprises a module for providing circuit service and a module for providing packet based service, and wherein different protocol stacks are used for packet service and circuit service.

48. (Previously Presented) The system of claim 47, wherein the interworking unit further comprises at least one module for connecting a first protocol to a second protocol for interface with the interworking function.

49. (Previously Presented) The method of claim 32, wherein the first data path is a mobile data path and the second data path is a public network data path.